times a mere wire, and sometimes very large plates (744); and also changing the terminal exciting plates Z and P, so that they were sometimes wires only and at others of great size, still the results were the same as those already obtained.

761. In illustration of the effect of distance, an experiment like that described with two exciting pairs and one intervening plate (748), fig. 53, was arranged so that 'the distance between the plates in the third cell could be increased to six or eight inches, or diminished to the thickness of a piece of intervening bibulous paper. Still the result was the same in both cases, the effect not being sensibly greater, when the plates were merely separated by the paper, than when a great way apart; so that the principal opposition to the current in this case does not depend upon the *quantity* of intervening electrolytic conductor, but on the *relation of its elements to the intensity of the current,* or to the chemical nature of the electrodes and the surrounding fluids.

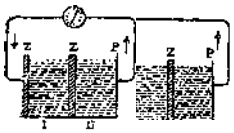

Fig. 60.

Fig. 62.

Fig. 61.

762. When the acid was sulphuric acid, *increasing its strength* in any of the cells caused no change in the effects; it did not produce a more intense current in the exciting cells (643), or cause the current produced to traverse the decomposing cells more freely. But if to very weak sulphuric acid a few drops of nitric acid were added, then either one or other of those effects could be produced; and, as might be expected in a case like this, where the exciting or conducting action bore a *direct* reference to the acid itself, increasing the strength of this (the nitric acid) also increased its powers.

763. The *nature of the interposed plate* was now varied to show its relation to the phenomena either of excitation or retardation, and amalgamated zinc was first substituted for platina. On employing one voltaic pair and one interposed zinc plate, fig. 60, there was as powerful a current, apparently, as if the interposed zinc plate was away. Hydrogen was evolved against P in cell n, and against the side of the second zinc in

cell i; but no
gas appeared against the side of the zinc in cell
ir, nor against
the zinc in cell i.